

CLAIMS

1. A method for allocating processor resources in a computer system having a plurality of central processors, comprising the steps of:

defining a plurality of logical partitions of said computer system, wherein each task executing in said computer system is assigned to a respective one of said logical partitions;

defining a plurality of sets of processors;

assigning each central processor of said multi-processor system to a respective set of said plurality of processor sets;

assigning each logical partition of said plurality of logical partitions to a respective set of said plurality of processor sets, wherein a first processor set of said plurality of processor sets has a plurality of logical partitions assigned to it;

assigning a respective processing capacity value to each of said plurality of logical partitions assigned to said first set, said capacity values representing processing capacity in units equivalent to a fixed number of physical central processors;

constraining tasks executing in a each logical partition to execute only in central processors assigned to the processor set to which the respective logical partition is assigned; and

constraining tasks executing in said each logical partition assigned to said first processor set to execute for a combined length of time equivalent to the processing capacity value assigned to the respective logical partition.

2. The method for allocating processor resources of claim 1, further comprising:

designating each respective logical partition assigned to said first processor set as either capped or uncapped;

wherein, with respect to a logical partition which is designated capped, said step of constraining tasks executing in the logical partition to execute for a combined length of time equivalent to the processing capacity value comprises preventing tasks in the partition from executing if the processing capacity value has been reached; and

8 wherein, with respect to a logical partition which is designated uncapped, said step
9 of constraining tasks executing in the logical partition to execute for a combined length of
10 time equivalent to the processing capacity value comprises preventing tasks in the partition
11 from executing if the processing capacity value has been reached, unless there is unused
12 processing capacity in the first processor set.

1 3. The method for allocating processor resources of claim 1, further comprising:
2 assigning a respective number of virtual processors to each of said plurality of logical
3 partitions assigned to said first processor set..

1 4. The method for allocating processor resources of claim 1, wherein a second processor
2 set of said plurality of processor sets has a plurality of logical partitions assigned to it, said
3 method further comprising:

4 assigning a respective processing capacity value to each of said plurality of logical
5 partitions assigned to said second set, said capacity values representing processing capacity
6 in units equivalent to a fixed number of physical central processors; and

7 constraining tasks executing in said each logical partition assigned to said second
8 processor set to execute for a combined length of time equivalent to the processing capacity
9 value assigned to the respective logical partition.

1 5. A computer system, comprising:
2 a plurality of central processing units;
3 a logical partitioning configuration function which receives a user definition of a
4 plurality of logical partitions of said computer system and a plurality of disjoint sets of said
5 central processing units, each logical partition being assigned to a respective one of said
6 plurality of disjoint sets of central processing units, said logical partitioning configuration
7 function supporting the assignment of a plurality of multiple logical partitions to a single
8 central processing unit set;
9 wherein, with respect to multiple logical partitions assigned to a single central
10 processing unit set, said logical partitioning configuration function receives a user definition
11 of a respective processing capacity value for each of said multiple logical partitions, said
12 processing capacity values representing processing capacity in units equivalent to a fixed
13 number of said central processing units; and
14 a logical partitioning enforcement function which constrains tasks executing in each
15 logical partition to execute only in central processor units of the set of central processing units
16 to which the respective logical partition is assigned, and constrains tasks executing in said
17 each said multiple logical partition assigned to a single central processing unit set to execute
18 for a combined length of time equivalent to the processing capacity value assigned to the
19 respective logical partition.

1 6. The computer system of claim 5,
2 wherein each logical partition contains a respective task dispatching function;
3 wherein said logical partitioning enforcement function comprises a respective low-
4 level virtual processor dispatcher for each set of central processing units operating below the
5 level of said task dispatching functions, said task dispatching functions dispatching tasks to
6 virtual processors, said virtual processor dispatchers dispatching said virtual processors to
7 said central processing units.